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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,275	01/26/2001	Konstantinos I. Papathomas	EN995064BVUS4	7979

5409 7590 03/12/2003

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EXAMINER	
BERMAN, SUSAN W	
ART UNIT	**PAPER NUMBER**
1711	16

DATE MAILED: 03/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

16

Office Action Summary	Application No.	Applicant(s)	
	09/771,275	PAPATHOMAS ET AL.	
	Examin r	Art Unit	
	Susan W Berman	1711	

-- Th MAILING DATE of this communication appears on the cov r sheet with the correspondence address --

Peri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-24 and 27-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-24 and 27-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01-07-2003 has been entered.

Response to Amendment

Applicant has amended claim 13 to recite that the "resin precursor consists essentially of ... prepolymer". The phrase "consists essentially of " is considered sufficient to exclude the ethylenically unsaturated precursors disclosed in the prior art because ethylenically unsaturated precursors would be expected to affect the basic characteristics of the claimed compositions employed in the claimed method. However, the primary reference to Christie et al is relied upon for teaching a method for encapsulating a solder joint wherein the composition consists essentially of cyanate esters.

Response to Arguments

Applicant's arguments filed 01-07-2003 have been fully considered but they are not persuasive.

With respect to the obviousness-type double patenting rejection of record, the claims of US 6,129,955 set forth photocuring of the compositions. Christie et al is relied upon for teaching that cyanate esters and/or polyepoxides are useful for providing a solder interconnection. Therefore, the rejection is maintained.

The rejections of claims under 35 USC 103(a) are maintained for the following reason. The primary reference is Christie et al. Christie et al disclose a method for encapsulating C4 connections and pin heads wherein the composition comprises a cycloaliphatic polyepoxide and/or a curable cyanate ester and a filler having a maximum particle size of 31 microns. Christie et al do not teach ethylenically unsaturated compounds. The presence of ethylenically usnaturated compounds in the compositions taugth

by Gaku et al and MacCormick et al are not relied upon for teaching addition of ethylenically usnaturated compounds into the composition taught by Christie et al . The secondary references are relied upon for teaching that photocuring can be employed to polymerize cyanate esters and sutiable photoinitiators to be employed.

Specification

The disclosure is objected to because of the following informalities: on page 24, lines 31-32 the weight percent of filler employed when the binder is present in an amount from 50% to 60% should be from 40% to 50% instead of from 50% to 60%; on page 21, line 25, applicant discloses "Arocy...F-10" while in Example 4 "Arocy L-10" is employed.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 13-19, 21-24 and 27-29 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. A composition containing a dispersed phase of particulate silica having a particle size of 31 microns or less is critical or essential to the practice of the invention, but not included in the claim(s); therefore, the claims are not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). See page 4, lines 9-12, page 25, lines 4-10 and Example 4. Fillers that are thermally conductive and electrically insulating are disclosed on page 24, lines 24-28.

Claims 13-24 and 27-29 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method wherein the composition comprises a cyanate ester, an organometallic photoinitiator and a dispersed phase of particulate silica and, optionally, thermally

conductive and electrically insulating filler (Alumina, etc.), does not reasonably provide enablement a method wherein the composition comprises a cyanate ester, any known photoinitiator and any known "dispersed filler". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. See page 4, lines 9-12, page 19, lines 8-12, page 25, lines 4-10 and Example 4. Fillers (not dispersed fillers) that are thermally conductive and electrically insulating are disclosed on page 24, lines 24-28. With respect to claim 17, it is the examiner's understanding that the diazonium and onium salts disclosed in the instant specification are employed in composition comprising epoxy resin precursors, while organometallic complex salts are employed in composition comprising cyanate este resin precursors. The instant claims now exclude epoxy resin precursors, therefore, the compositions would not be expected to contain onium salt photoinitiators.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 18 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no antecedent basis in claim 13 for the reciation "about 40% to about 75% by weight dispersed silica" because silica is not set forth in claim 13. It is suggested that claim 18 should set forth wherein the dispersed filler comprises about 40% to about 75% by weight dispersed silica. There is no antecedent basis in claim 19 for the recitation "particle size of the dispersed silica..." because claim 19 recites "dispersed filler". It is suggested that claim 20 should set forth "wherein the particle size of the fused silica and amorphous silica is 31 microns or less". Note the rejection of claim 13 under 35 USC 112, first paragraph set forth above with respect to the recitation of "dispersed filler" in claim 13.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 13-22, 24 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view of Gaku et al (4,554,346).

Christie et al disclose a method for encapsulating C4 connections and pin heads (column 7, lines 1-16). Solder interconnections are filled with a composition comprising a cycloaliphatic polyepoxide and/or a curable cyanate ester and a filler having a maximum particle size of 31 microns and cured by heating. Christie et al do not teach employing a photoinitiator, such as an organometallic complex salt or onium salt, and photocuring in the disclosed method. Gaku et al disclose curable resins comprising a cyanate ester compound, a hydroxy-functional ethylenically unsaturated compound and a photoinitiator that provide products having excellent heat resistance and electrical properties. Reinforcing agents and fillers taught by Gaku et al include epoxy resins, elastic rubbers, silica, alumina and boron nitride (columns 6-7).

It would have been obvious to one skilled in the art to employ a photoinitiator and photocuring in the compositions and method disclosed by Christie et al, as suggested by Gaku et al in analogous art. The reason is that Christie et al and Gaku et al each disclose curing compositions comprising cyanate esters. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation that photocuring would provide the same product as heating since the polymerizable components are the same. It would have been obvious to one skilled in the art to include the reinforcing agents and fillers taught by Gaku et al in the compositions disclosed by Christie et al in order to obtain the reinforcing and filler properties of these additives taught by Gaku et al. With respect to claim 17, It

would have been obvious to one skilled in the art to select diphenyliodonium initiator from those taught by Gaku et al because Gaku et al teach that any of the disclosed initiator/sensitizers can be used and because the compositions taught by Christie et al include epoxy compounds that are known to be photocurable in the presence of iodonium initiators.

Claims 13-16, 18-22 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view of McCormick et al (5,744,557).

The disclosure of Christie et al is discussed above. McCormick et al teach cyanate ester/free radically polymerizable monomer adhesives for electronic adhesives. See column 19, line 611, to column 23, line 22. McCormick et al teach that the disclosed catalyst system of organometallic curative and free radical generators may be activated thermally or photochemically or by both methods in combination (column 6, lines 37-40, and column 20, lines 17-21). Other photoinitaitors are taught in column 11, lines 40-50.

It would have been obvious to one skilled in the art to employ an organometallic catalyst system and photoinitiation, as taught by McCormick et al, in the compositions and method disclosed by Christie et al. The reason is that Christie et al and McCormick et al disclose compositions comprising the same cyanate ester and epoxy polymerizable components. McCormick et al teach that cyanate ester/epoxy compositions can be photocured and provide adhesives for electronic applications. Therefore, one of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation that photocuring the cyanate ester compositions taught by Christie et al would provide the same product as heating since the polymerizable compositions taught by McCormick et al also comprise cyanate esters.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view of Gaku et al or McCormick et al, as applied to claim 13 above, and further in view of Papathomas et al (5,194,930). Christie et al teach using silica filler optionally treated with a coupling agent. Papathomas et al disclose amino- and epoxy-functional silane coupling agents for treating high purity fused or amorphous silica in compositions analogous to those taught by Christie et al, Gaku et al and McCormick et al (column 10, lines 47-56). It would have been obvious to one skilled in the art to employ the coupling agents taught by Papathomas et al as the coupling agent taught by Christie et al. The coupling agent taught in the prior art corresponds to the surface treating agents instantly disclosed, as is well known in the art.

Double Patenting

Claims 13-24 and 27-29 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,129,955 in view of Christie et al. Although the conflicting claims are not identical, they are not patentably distinct from each other because the comprising language of the claims of US '955 encompasses compositions including a cyanate ester, such as the cyanate esters disclosed in columns 11-12 of the patent. Christie et al teach, in analogous art, that compositions comprising a cycloalipahtic polyepoxide and/or cyanate ester or prepolymer thereof are useful for providing a solder interconnection. It would have been obvious to one skilled in the art to include a cyanate ester compound in the polyepoxide compositions used in the method claimed in US '955 and to photocure the compositions as set forth in the claims.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Berman whose telephone number is (703) 308-0040.

The fax number for this group is (703) 872-9310 or, for submissions after Final Rejection, (703) 872-9311.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist at telephone number (703) 308-0661.

Susan Berman

Susan Berman
Primary Examiner
Art Unit 1711

S B
March 10, 2003